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(54) **METHOD FOR COMMUNICATION USING ADAPTIVE MODEM**

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(58) **Field of Search** 375/222, 218; 367/132, 134, 3

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(57) **ABSTRACT**

A method to improve communication system performance using an adaptive modem that estimates the communication channel scattering function to select one of several modulation schemes. The scattering function is estimated from the channel's frequency (doppler) and time (multipath) spreading effects on a probe signal. The probe signal is transmitted from a first modem to a second modem. The second modem processes the channel measurements and transmits the channel spreading factors to the first modem. Based upon the channel scattering function estimate, channel characteristic data, propagation models, strategic information, and modem position estimates, the first modem selects one of several modulation schemes. Subsequent data transmissions from the first modem to the second modem contain a modulation mode identifier. The second modem uses the modulation mode identifier to select the correct demodulation scheme. Upon the occurrence of predetermined criteria, the channel scattering function estimate may be updated and a new modulation scheme selected to continue transmission. Each modem is equipped with the probe signal to allow bi-directional channel characterization.

18 Claims, 2 Drawing Sheets